

Selection of a neotype for *Apteryx mantelli* Bartlett, 1852, with the support of genetic data

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SUMMARY.—Genetic studies in kiwis (*Apteryx* spp.) have led to a number of recent taxonomic changes, including the recognition of three species of brown kiwi. For one of these species, North Island Brown Kiwi *Apteryx mantelli* Bartlett, 1852, no holotype was originally nominated and the type series has remained unidentified. We searched for potential syntypes but were unsuccessful. Therefore, we designate a neotype that preserves the current usage of *A. mantelli* for extant North Island brown kiwi.

Studies of genetic variation in modern and ancient populations of New Zealand's Brown Kiwi *Apteryx australis* (Baker *et al.* 1995, Burbidge *et al.* 2003, Shepherd & Lambert 2008) have revealed distinct genetic groupings that are not completely congruent with traditional taxonomic schemes (e.g. Turbott 1990). These studies have led to a number of taxonomic changes, including the description of a new kiwi species, *Apteryx rowi* Tennyson *et al.*, 2003, from the west coast of New Zealand's South Island. Furthermore, it is now widely accepted that North Island Brown Kiwi *A. mantelli* Bartlett, 1852, is specifically distinct from South Island Brown Kiwi *A. australis* Shaw, 1813, and they are now usually listed as species as they were originally described (e.g., Holdaway *et al.* 2001, Tennyson *et al.* 2003, Robertson 2003).

Abraham Dee Bartlett (1812–97), a British taxidermist and natural history dealer who published papers on avian taxonomy, behavioural and avicultural matters (Anon. 1897) first recognised the distinctiveness of the brown kiwi from the North Island. When Bartlett described *Apteryx mantelli* at a meeting of the Zoological Society of London on 10 December 1850, he gave the imprecise locality of 'North Island' and, as was then common practice, did not nominate a holotype (Bartlett 1852). Bartlett specified his use of kiwi specimens from the collections of the British Museum, the Zoological Society and the Royal College of Surgeons, but gave no indication of the numbers of individuals involved, nor their specific identifications. None of these syntypes has since been located.

In the course of studies of genetic diversity in brown kiwis, complex phylogeographical patterns have been revealed (Baker *et al.* 1995, Burbidge *et al.* 2003, Shepherd & Lambert 2008) that make it necessary to clarify the biological entity to which the name *Apteryx mantelli* Bartlett, 1852, applies. Modern and ancient samples of brown kiwis from the North Island separate into several distinct genetic clades, including one now believed to be only extant in the South Island (Shepherd & Lambert 2008). It is not known to which of these the name *A. mantelli* Bartlett, 1852, should be associated, thus precluding any further taxonomic distinctions.

We set out to locate specimens in Bartlett's syntype series, and nominate a lectotype if appropriate. Measurements from two potential syntypes were compared with Bartlett's description but since none was a close match, a neotype is nominated that preserves the current usage of *Apteryx mantelli* for extant North Island Brown Kiwi.

Methods

Identification of potential syntypes

Using Bartlett's description, the collections in the Royal College of Surgeons and Natural History Museum in Tring, where the avian collections of the former British Museum and Zoological Society's museum are now housed, were searched for potential syntypes of *Apteryx mantelli* Bartlett, 1852, during 2005/06.

Results and designation of a neotype

No reliably traceable pre-1850 specimens of *Apteryx mantelli* appear to have survived in the collections of the Royal College of Surgeons, which now include only a small number of fluid-preserved, partial anatomical preparations (SurgiCat 2006), most of which are not identified beyond genus. Whilst further investigation may reveal some of this material to potentially hold syntype status for *A. mantelli*, given that they cannot be adequately compared to the description, it would be inappropriate to use any of them as a potential lectotype.

In his catalogue of birds in the British Museum, Gray (1844) listed only three specimens of *Apteryx australis*, two of which were subsequently re-identified as *A. mantelli*: BMNH 1838.5.12.102, presented by the Earl of Derby and BMNH 1842.5.17.2, presented by Miss Rebecca Stone. These two specimens are the only extant examples of *A. mantelli* in the NHM collections that pre-date Bartlett's 1850 research. No specimens of *A. australis* or *A. mantelli* were found amongst the collections received by the British Museum at the dispersal of the Zoological Society's museum in 1855.

DNA analysis of sequences obtained from the two BMNH specimens grouped them with previously published North Island Brown Kiwi DNA sequences (J. Haile and L. Shepherd unpubl.; GenBank accession nos. DG295829 and DQ295830). However, comparison of Bartlett's plate XXXI, depicting the right foot in mirror image (as is usual in lithography), with those of both specimens has revealed that neither is an exact match for the plate. Both are scutellated significantly further up the tarsus than is shown on the plate. Although BMNH 1838.5.12.102 matches Bartlett's original description in its dark plumage coloration, neither specimen is a close match to Bartlett's morphological measurements (Table 1). We therefore consider that both BMNH 1838.5.12.102 and BMNH 1842.5.17.2 are not sufficiently similar to Bartlett's description of *A. mantelli* to be considered syntypes. Owing to the poor preservation of the BMNH specimens we have decided not to nominate either of these specimens as the neotype and instead select the best-preserved specimen of this taxon for which DNA sequence data is available.

TABLE 1.

Comparison of measurements from Bartlett (1852) and *Apteryx mantelli* study skins. Bartlett's original measurements were given in inches; the millimetre equivalent is provided in brackets. Measurement methods follow Tennyson *et al.* (2003). - = data not available.

	Bartlett (1852)	BMNH 1838.5.12.102	BMNH 1842.5.17.2	OR.9375 (neotype)
Bill from forehead	6 in. (101.6)	109.0	119.3	127.2
Tarsus	2 ½ in. (69.8)	67.6	70.2	c.76
Middle toe and claw	3 ⅝ in. (63.5)	61.8	62.5	c.80
Bristle length	-	-	-	68.2
Bristle %	-	-	-	53.6
Scute count (right leg)	-	-	-	7

Apteryx mantelli Bartlett, 1852

Neotype.—Female skin, no. OR. 9375 of the collection of the Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand. Collected at Ohakune, North Island, New Zealand by L. Rowles on 17 August 1960 and presented to the museum by M. P. Scott. DNA sequences from this specimen strongly supported its placement within a clade comprising North Island Brown Kiwi (Haplotype 29 in Fig. 1 from Shepherd & Lambert 2008; GenBank accession nos. AY713368 and AY713335). Furthermore, the morphology of this specimen represents typical *A. mantelli* and has most of the characters originally described by Bartlett (1852) to distinguish his species from *A. australis*, apart from his scute count, which appears erroneous (see Tennyson *et al.* 2003). Distinguishing characters for all brown kiwis were presented in Tennyson *et al.* (2003).

Description of neotype.—Adult female of weight 51b 15 oz (2,690 g). Dried colours are as follows. Feathers: streaked brown and black lengthwise, with a rufous hue on the bird's back and flanks. Outer wing feathers: unbarred. Bill: horn. Legs and claws: dark brown. Plumage 'harsh' when stroked backwards. Elongate barbless regions at the wing feather bases. Measurements are given in Table 1.

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